

REMARKS

Amendments To The Specification

Applicants have carefully considered the rejections raised in the Action dated June 22, 2006. As a result, the specification including claims have been amended to comply with the Examiner's requirements as outlined herebelow. The claims have been amended to more particularly point out and claim the present invention. Particularly, the claims have been revised to recite:

A gas-liquid-solid circulating fluidized bed system”
which is supported for example on page 12, lines 11 to 13, particularly line 12 and in the Summary of Invention on page 7, line 11. Therefore no new matter has been added by this amendment. Claim 8 has been amended as required by the Examiner to delete the phrase “operated in a conventional fluidized bed regime”.

Claims 21-33 directed to a non-elected invention are being cancelled from the application. It is respectfully submitted that the Applicant retains the right to present the non-elected invention in a divisional application.

Claims 1-17 have been rejected under 35 U.S.C. § 112, first paragraph, as being based on the disclosure being not enabling on the grounds that two essential structural elements, separator 46 and clarifier 76, are not recited in claims. In this respect, Applicants note that the Examiner has interpreted the disclosure on page 11, lines 19-23 which states “both the separator 46 and clarifier 76 also play a critical role for pressure balance between the rise column and the downer column” as meaning “the separator 46 and clarifier 76 play a critical role in the system of the invention. The Examiner has also rejected claims 1-17 under 35 U.S.C. § 112, second paragraph due to the omission of this limitation in claim 1.

Applicants respectfully request withdrawal of this rejection for the following reasons. This statement at issue (or in question) was only referring to both the separator 46 and clarifier 76 being important for getting a pressure balance in the system, which while it may be the preferred or optimum situation, is not essential, for the system to work as a whole. Nowhere in the specification is it stated that, for the system to operate to some degree, the pressures have to be balanced as provided with the separator 46 and clarifier 76. Applicants note that when the separator 46 and clarifier 76 are used, pressure balance is achieved more quickly but even without the system will come to balance albeit more slowly than achieved with the separator 46 and clarifier 76.

Patentability of the Claims Over the Cited References

The Examiner has stated that showing that the inventions of the present application and Bassi et al. were commonly owned will preclude a rejection under 35, U.S.C. 103(a). Responsively, a deed of assignment is being filed concurrently herewith in which the assignee is The University of Western Ontario, so that the present invention is commonly owned with U.S. Patent No. 6,716,344 issued to Bassi et al. Pursuant to the Assignee's employment contract with staff and faculty, an invention made at The University of Western Ontario is owned by The University of Western Ontario at the time the invention is made and so the inventions in U.S. Patent No. 6,716,344 and the present claims were commonly owned at the time the invention of the present application was made.

The Examiner has rejected claims 1-20 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 6,716,344 issued to Bassi et al. The Examiner has stated that:

“Applicant should note that the system recited in claims 1-11 of U.S. Patent No. 6,716,344 is structurally capable of being employed with solid

particles having immobilized bacteria coated thereon, and is capable of injecting a gas into the fluidized beds (i.e. via nozzles 30 and 38); and therefore, this system is inherently capable of creating the recited aerobic, anoxic and anaerobic “zones”.

Applicants disagree with this position. The standard for obviousness is not whether a prior art invention is *capable* of performing the same function as a claimed invention. In contrast, to make a prima facie case of obviousness, the Examiner must show that the prior art teaches every claim limitation. In this case, the Bassi reference does not disclose every limitation of at least independent claim 1. Namely, Bassi does not disclose the limitations of bacteria immobilized on the particles and the nozzles for gas injection which are structural limitations in claim 1 not found anywhere in Bassi. Further, Bassi is directed to a fluidized bed system for ion exchange, not waste water treatment, and these two processes use different fluidized bed structures as discussed above. There is nothing in Bassi which would lead those skilled in the art to the subject matter of claim 1. The subject matter of claim 1 is simply not reciting an old structure for a new use, but it is reciting a new structure not found in Bassi for performing waste water treatment.

The Examiner has rejected claims 1-20 under 35 U.S.C. § 102(e) as being anticipated by the reference United States Patent No. 6,716,344 issued to Bassi et al. Reconsideration of the grounds for rejection under 35 U.S.C. § 102(e) is respectfully solicited for the following reasons. The Examiner has stated that:

“Applicant should note that the intended use of a device is not a structural limitation, and hence cannot be relied upon to patentably distinguish apparatus claims.”

Applicants respectfully submit there are definite structural differences between claim 1 and Bassi et al. Bassi et al. is directed to a liquid-solid

circulating fluidized bed for use as an **ion exchange medium**, see the Abstract, Field of the Invention, Brief Description of the Invention, column 2, lines 10, 15, and column 2 line 55 to column 3, line 7. Column 3, line 37 to 40, clearly disclose that ion exchange is the process performed by the Bassi's device.

Claim 1 of the present application contains several structural limitations not found in Bassi et al. First, claim 1 recites a structure for a "**gas-liquid-solid** circulating fluidized bed" while, as mentioned above, Bassi discloses a "**liquid-solids** circulating fluidized bed".

In addition, the limitation in lines 2 and 3 of present claim 1:

"solid particles having effective immobilized bacterial coated thereon" is completely absent from Bassi et al. and is not disclosed as a structural feature in Bassi in any way. The bacteria are used in the present wastewater treatment system. Without the bacteria present, the apparatus would not exhibit any efficacy for wastewater treatment. In the present system, the bacteria are immobilized onto the particles resulting in a significant increase in the system efficiency since the bacteria have excellent exposure to the waste water. In the Bassi patent, they disclose ion exchange and/or adsorption, where some ionic species in the liquid are adsorbed onto the ion exchange particles. These particles are then transported to the second (or from the second to the first) fluidized bed where they are desorbed and no bacteria are used in the process.

The Examiner has stated on page 5, of the Examiner's Report that:

"The reference (Bassi) discloses a liquid-solid circulating system containing all of the recited structural elements and structural interrelationships; and this reference system is inherently capable of being employed as a biological nutrient removal system. Applicant should note that the intended use of a device is not a structural limitation, and hence cannot be relied upon to patentably distinguish apparatus claims."

Applicants note the immobilized bacteria is a structural limitation, and is not found in Bassi and hence structurally distinguishes claim 1 over Bassi.

Further, the limitation in present claim 1, namely:

“gas injection means to inject gas into one or both of the first and second liquid fluidized beds”

is also completely absent in Bassi. The Examiner refers to nozzles 30 and 38 being possible nozzles for injecting gas, however, Applicants note that Bassi clearly discloses these nozzles are for liquid flow into the system. To argue that nozzles 30 and 38 shown in Figure 1 of Bassi could be used for injecting gas, is to read a structural limitation positively recited in present claim 1 into the device of Bassi which is something that was clearly not intended by Bassi et al. Gas injection means is simply not disclosed in the Bassi structure. Further as mentioned above these nozzles 30 and 38 are clearly disclosed for “liquid” injection into the device, see column 3, lines 56-58 and column 4, lines 8 -10.

The result of the “gas injection means” is to produce a “gas-liquid-solid fluidized bed, while the absence of this feature gives a “liquid-solid fluidized bed”, as disclosed on page 12, lines 11 to 13. Bassi et al. discloses only this latter type of bed, namely a “liquid-solid fluidized bed”, see the title, first line of the abstract, in the objects in column 2, lines 8 - 10, column 2, lines 58 - 60 and first line of claim 1 to list several examples.

Since Bassi is completely silent with respect to these two limitations recited in claim 1, and since the features of present claim 1 give quite significantly different results than the structure of Bassi, Applicants respectfully submit claim 1 is not anticipated by Bassi. For the same reasoning Applicants further submit these claims recite subject matter not obvious based on a reading of Bassi.

In view of the foregoing discussion (and claim amendments), reconsideration and withdrawal of the rejections of claims 1 to 20 is respectfully solicited and favorable consideration and allowance of claims 1 to 20 is requested.

Should the Examiner have any questions regarding the allowability of the claims with respect to the art, it would be appreciated if the Examiner would contact the undersigned attorney-of-record at the telephone number shown below for further expediting the prosecution of the application.

Respectfully submitted,

DOWELL & DOWELL, P.C.

A handwritten signature in black ink, appearing to read 'R. A. Dowell', is written over the printed name and firm name.

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